Platforms, Digital Infrastructure & Interoperability

Thu. Nov 12, 2026 4:00 PM - 5:30 PM JST | Thu. Nov 12, 2026 7:00 AM - 8:30 AM UTC | Room B (Kujaku) (2F)

Oral B3 Ocean Digital Twins for Coastal Resilience, Ecosystems and Ocean Health

Chair: Ruoying He, Hakase Hayashida

4:15 PM - 4:30 PM JST | 7:15 AM - 7:30 AM UTC

[_NIQuy3K-02] A Digital Twin System for Smart Aquaculture in Sansha Bay

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This project, based on the needs of high-quality development of the marine economy in Fujian Province, takes Sansha Bay as a demonstration sea area and addresses multiple environmental risks such as extreme temperatures, sudden salinity changes, and red tides. It has constructed a digital twin system for intelligent prevention and control of aquaculture environmental disasters in bay areas. By integrating a high-precision three-dimensional monitoring network of temperature salinity profiles, a three-dimensional hydrodynamic ecological coupled model, a data driven short term early warning model, and the DeepSeek large language model, the system possesses real time dynamic simulation and multi source data assimilation capabilities. It can forecast water temperature, salinity, and red tide probability for the next three days, and automatically generate tiered prevention and control strategies based on an intelligent knowledge base, forming a whole chain coordination mechanism of "monitoring—early warning—prevention and control—decision making". At the same time, the project establishes a three tier interactive platform for decision makers, managers, and farmers, enabling precise dissemination of risk prevention and control measures. Through full process application demonstration in Sansha Bay, it accumulates practical experience and explores promotion models, providing a demonstration model for bay type aquaculture areas to achieve a win win situation of "ecological security and production efficiency enhancement", and contributing to the creation of a new growth pole for the blue economy.

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